

Associations of the TyG Index, TG/HDL-C Ratio, and CHG Index with Hypertension in Young and Middle-Aged Individuals

Sonja Smiljić^{1,2}, Aleksandra Ilić², Angelina Stevanović¹, Vojkan Nestorović², Srna Šapić³

¹ Department of Cardiology, Health Center Euromedik, Belgrade, Serbia

² Department of Physiology, Faculty of Medicine, University of Priština in Kosovska Mitrovica, Kosovska Mitrovica, Serbia

³ Independent Researcher, Belgrade, Serbia

(Corresponding Author: Sonja Smiljić, sonja.smiljic@med.pr.ac.rs)

Citation: Smiljić, S., Ilić, A., Stevanović, A., Nestorović, V., & Šapić, S. (2026). Associations of the TyG index, TG/HDL-C ratio, and CHG index with hypertension in young and middle-aged individuals. *International Journal of Health Supplements*, 1(Suppl. 3), 300–301. <https://doi.org/10.82051/ijhs-2026-Suppl.3>

Introduction. Metabolic dysfunction is associated with an increased risk of arterial hypertension. The triglyceride–glucose (TyG) index, triglyceride-to-high-density lipoprotein cholesterol (TG/HDL-C) ratio, and cholesterol–HDL–glucose (CHG) index are potential markers of cardiometabolic risk. This study aimed to investigate the associations of these indices with arterial hypertension in young and middle-aged individuals.

Methods. This cross-sectional study included 610 participants of both sexes, aged 19–59 years. Arterial hypertension was assessed by blood pressure measurement. The TyG index was calculated as $\ln[\text{fasting triglycerides (mg/dL)} \times \text{fasting glucose (mg/dL)} / 2]$, the TG/HDL-C ratio as fasting triglycerides divided by HDL cholesterol, and the CHG index as $\ln[\text{total cholesterol (mg/dL)} \times \text{fasting glucose (mg/dL)} / (2 \times \text{HDL cholesterol (mg/dL)})]$. Categorical variables were analyzed using the chi-square or Fisher's exact test, and continuous variables using the Mann–Whitney U test. Statistical significance was set at $p < 0.05$.

Results. Compared with normotensive participants, hypertensive individuals showed significant differences in HDL cholesterol ($p < 0.001$), triglycerides ($p = 0.005$), TG/HDL-C ratio ($p < 0.001$), fasting glucose ($p = 0.038$), TyG index ($p = 0.003$), and CHG index ($p < 0.001$). Significant differences were also observed in carotid artery sclerosis ($p = 0.003$) and right carotid artery parameters ($p = 0.002$). Total cholesterol ($p = 0.368$) and LDL cholesterol ($p = 0.204$) showed no significant differences. Unhealthy lifestyle habits, sedentary occupation, smoking, and increased body weight were more common among hypertensive participants ($p < 0.05$).

Discussion. Hypertension was associated with an adverse metabolic profile and differences in selected carotid artery parameters. All three metabolic indices differed significantly between hypertensive and normotensive participants, supporting their potential relevance as cardiometabolic risk markers. However, the cross-sectional design precludes causal conclusions. Further studies are required to establish their clinical utility and discriminatory performance.

Keywords: Hypertension, Triglycerides, Blood Glucose, Cholesterol, HDL, Cardiometabolic Risk,

Cross-Sectional Studies

© The Author(s) 2026. This abstract is published by iEditore and distributed under the terms of the [Creative Commons Attribution 4.0 International License \(CC BY 4.0\)](#).

Funding: This research received no external funding. **Conflict of Interest:** The authors declare no conflict of interest.